

approach that might be used by municipal government to forecast the violent consequences for the city of Ternopil in October where the outbreak of the epidemic of flu was particularly sharp and earlier.

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#### P103-004

##### **Metabolomics, a new approach to identify biomarkers of 137Cs health effects**

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After Chernobyl nuclear accident, pathologies were described in humans living in contaminated territories and biological effects were published in scientific literature about 137Cs effects—the most persistent radionuclide in these areas. Questions regarding public health around Chernobyl could be now completed with a non-invasive analytical technique. In order to identify specific biomarkers of metabolism disorder, we developed a rat model chronically exposed to 137Cs through drinking water. The biological impact of contamination was evaluated using a metabolomic approach, allowing the detection of several hundreds of metabolites representative of metabolic phenotypes link to disease states. Plasma and urine were collected and analysed with a LC–MS system at the end of the contamination protocol. Multivariate biostatistical methods were used to reveal a metabolic disrupt upon radioactive caesium exposure. 341 metabolite features were detected in urine and 957 in plasma. Among them, 21.4% (73) in urine and 12.7% (121) in plasma allowed to discriminate among control and contaminated rats. Correlation network analysis of these discriminating metabolites allowed the identification of a subset of 59 highly intercorrelated metabolic variables (Pearson correlation > 0.9) clustering together. This metabolic cluster made up of 16 urines and of 43 plasma metabolite variables is likely to be relevant to describe chronic 137Cs exposure, and its metabolites annotation is underway. In conclusion 137Cs chronic ingestion induces a specific biological signature in both plasma and urine. This preliminary result confirms the interest of metabolomic approach in biomarker search with the characterization of specific metabolic disorder after exposure. Annotation of the most relevant metabolites would be likely to give new insights into the biological mechanism linked to 137Cs chronic contamination.

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#### P103-005

##### **Potential health and environment threats connected with chemical accidents in Poland in 2005–2007**

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**Objective:** Temporal and spatial distribution of acute releases of dangerous chemicals in Poland has been followed since 2005, when Nofer Institute of Occupational Medicine (NIOM) (Lodz, Poland) started to cooperate with Agency for Toxic Substances and Diseases Registry (ATSDR) (Atlanta, USA), due to implementation of the Hazardous Substances Emergency Events Surveillance (HSEES) system in Poland. Some analysis of collected data was pointed at initial assessment of potential effects of spilled chemicals on public health and environment. **Methods:** Data on dangerous chemicals

releases were electronically passed to NIOM in the form of reports from the scene of event prepared by first responders (firefighters). The selected information was included into unique web-based database and statistically analyzed. Some of the analysis results have been studied further in the context of public health and environmental hazards. Comparisons with legal regulations in force concerning classification of chemicals on their health and environmental impact, were made. **Results:** In Poland in 2005–2007 in over 600 events connected with chemicals releases over 500 people were injured, and over 250 different substances were released. Most frequently released substances are classified as corrosive and dangerous for environment according to CLP Regulation. **Conclusions:** Detailed knowledge on kind of chemicals, scale, location of spills and people injured or potentially exposed is essential in preparing of suitable preventive actions or strategies to reduce the adverse influence of uncontrollably released chemicals on health and environment in long term perspective.

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#### P103-006

##### **Cadmium levels in blood and tissues and the correlation between blood cadmium and plasma testosterone in beef cattle**

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Since the incidence of cadmium- (Cd-) polluted environment has been declared in the area of Mae Sot district, Tak province, Thailand, investigation on Cd-contaminated agricultural products and human health has been conducted. This study aimed to investigate the levels of Cd in blood, liver and kidney of beef cattle at different age and the possible adverse health impact on the animals. The results revealed that beef cattle reared in this polluted area accumulated high Cd levels in kidney and liver, in which the significant positive correlations between tissue Cd levels and age were detected. With regard to food safety standard, 62% of the studied cattle had renal Cd at levels exceeding the safety limit (1 mg/kg) and 43% concomitantly had hepatic Cd higher than the permitted level (0.5 mg/kg). It was also suggested that environmental Cd exposure could disrupt testosterone homeostasis as demonstrated by the correlation analysis between blood Cd levels and testosterone levels in each age group. These findings indicated that Cd levels in food-producing grazing animals would help reflect the levels of environmental contamination and be valuable in risk estimation of Cd carry-over on human via food chain. The information implied that testicular function was sensitive to Cd and data obtained from the animals could be regarded as a bio-indicator for risk of reproductive dysfunction in humans.

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#### P103-007

##### **Effect of CYP1A1 and EPHX1 polymorphisms on the level of BPDE-Alb adducts in PAH-environmental exposure**

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Polycyclic aromatic hydrocarbons (PAHs) are widely presented in the environment, as products of the combustion of fuels, of cigarette smoking, in ambient indoor air, and in grilled and